

DISCOVERY

The effects of classroom exercise and home assignment on the academic performance of students in mathematics in Nigerian secondary school

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Author Affiliation:

Department of Mathematics, Adeyemi College of Education, Ondo, Nigeria

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Sunday IA, Ganiyu AA

ABSTRACT

This paper is designed to investigate the effects of classroom exercise and home assignment on the academic performance of students in Mathematics in Nigerian senior secondary schools. Random sampling technique was used for the purpose of the study. Three secondary schools were randomly picked for this study. Data for the study were collected from the selected schools through the use of questionnaires, pre-test and post test. One hundred and twenty (120) students consisting both boys and girls were selected at random from each school. The data was analyzed using Pearson's Product Moment Correlation, Analysis of Variance and t-test. Analysis of the result shows that there is significant relationship between class work and home assignment and students' academic performance in Mathematics. Also, students taught using home assignment performed significantly better than students in the other groups who were not exposed to home assignment. This confirms the result of the hypotheses which states that with adequate classroom exercise and home assignment, students will have better performance in Mathematics. Based on the outcome of these findings, it was recommended that actions should be built into policies of Nigeria that teachers should endeavour to give home assignments to their students after classroom work daily and parents and wards should recon with take home assignments by monitoring their children at home in ensuring that they do the assignment given to them by their teachers on daily basis to improve the performance of their children in Mathematics.

Keywords: Mathematics, Home Assignment, Class Work, Pearson's Product Moment Correlation, Analysis of Variance, t-test, Teachers, Parents.

1. INTRODUCTION

Mathematics is the science that deals with the logics of shape, quantity and arrangement. Mathematics is all around us, in everything we do. It is the building block for everything in our daily lives, including mobile devices, architecture (ancient and modern), art, money, engineering, and even sports (Elaine, 2013).

Mathematics may be described as the fundamental science. It may be broadly describe as the science of space, time and number. The universe exists in space and time, and is constituted of units of matter (Pawan, 2013).

Mathematics is the science and study of numbers, set of points and various abstract elements together with the relations that exist between them (Adenegan and Balogun, 2011; Sangeetha et al., 2016). Mathematics as the queen and mother of sciences is a subject which dates back to earliest civilization commencing from the finger counting system. The subject developed into the act of measurement later called geometry which shot the Egyptians into limelight as builders of pyramids and tombs. They also formed the colander of twelve lunar form of the combination of annual flooding of river rule with some elements of astronomy.

The Greeks perceive Mathematics as independent subject that is able in developing the mind of philosophers and rulers. Many famous philosophers in Greek were actually mathematicians such as Plato, Aristotle and J. J. Rossean to mention a few. Plato in his love for Mathematics had the following inscription on the door of his school "Let no man ignorant of geometry enters". From the fore going historical background, students need to appreciate the fact that Mathematics is not just an abstract and useless brain formatting subject but a vital tool gradually developed over time to solve, explain and express the challenging intricate environment in which man find himself. Education is not a mere acquisition of facts let alone mere memorization and regulation of facts.

Mathematics is one of the most important subjects that are taught at all levels of Education. It is a subject that cuts across all the sciences in Mathematics (Ganiyu, 2012). Mathematics is the basic for technological take-off and sustenance of industrial growth which in turns could lead to improve economy and higher standard of living in Nigeria. It influence is seen virtually in anything man can think of, Governments, people and professional in various discipline place much emphasis on Mathematics because of its versatility and practical utility value both in nations technological advancement and everyday life of man. Mathematics is also used as a basic entry requirement into any of the prestigious courses such as medicine, architecture and engineering among other degree programmes (Adenegan et al., 2016). The above mentioned points may be accountable as reasons why the Federal Government of Nigeria has made Mathematics compulsory both at the primary and secondary school levels. The subject must be taken and passed by all secondary school students circle before they are allowed to proceed to tertiary institution.

The secondary school Mathematics curriculum continues the development of the learning of Mathematics in the primary school. To enable students to cope confidently with the Mathematics needed in their future studies, workplace and daily life. In a technological information-rich society, the curriculum aims at developing in students the ability to conceptualize, inquire, reason and communicate mathematically and to use Mathematics to formulate and solve problems in daily life as well as in Mathematics contests. The extent to which these noble objective has been achieve leaves much to be desired in our daily experience shows that the hopes of many school leavers have been jeopardize because of their inability to make a credit in Mathematics.

The effectiveness of classroom exercise and home assignments in facilitating students learning in Mathematics has been under examination for several decades. Research has included the general effects of classroom exercise and home assignment on achievement, the effectiveness of graded compared to non graded home assignment and the impact of classroom exercise and home assignment on students' attitudes (Adenegan and Adedoye, 2017). Several factors may have been adduced for poor performance of students in Mathematics. These include; the poor foundation of Mathematics that some students have had, lack of interest in hardworking i.e. laziness and lack of interest in the subject (Lawal et al., 2016). Ganiyu, (2012) stated that some other factors that could be responsible for poor performance of students in Mathematics are feeling of inadequacy, lack of motivation and self-confidence, shortage of qualified Mathematics teachers, poor facilities, equipment and instructional materials for effective teaching, the use of traditional chalk and talk methods, large pupils to teacher ratio and Mathematics phobia.

Adedeji, (2007) stated that individual characteristics such as intelligence, cognitive styles and personality play an important role in learning and instruction, as does the context learning. Other research findings have shown that individual students' characteristics variables such as motivational orientations, self-esteem and learning approaches are important factors influencing academic performance. Other important factors that can arouse students' interest in the study of Mathematics in secondary school are class work or classroom exercise and homework or take home assignment (Balogun, 2016; Idiong and Augustine, 2016).

Class work

Class work is the written or oral work done in a classroom by students. It is also define as the work done by the students and teacher jointly. Class work is an online instruction and assessment solution proven to help students become critical thinkers and independent learners. This could be seen in Newswire, 2016.

Benefits of class work

The following are the benefits of class work:

Greater possibility of tasks being completed on time

The teacher has ultimate control over the class.

Greater potential for lesson to be executed as planned.

Achieving basic curriculum objectives

Class work brings about increase discipline and is therefore useful within classes where this is an issue.

It has potential to achieve accuracy and precision in performance and is therefore useful when a predetermined model must be adhered to, or a synchronized performance is required.

Class work gives the instructors a prompt feedback about students' achievement which shows that the students have actually learnt a particular concept or not.

Class work also enables the teacher to know whether the stated behavioural /instructional objective has been achieved or otherwise.

Homework/home assignment

Home assignment constitutes the out-of-class activities that the teachers assign to students (Ganiyu, 2012). These activities are extension of school work. Home assignment or homework can include practice homework that emphasizes newly acquired skills. It can be in the form of preparation assignments to make students get ready for class activities.

Cooper et al., (2006), summarize the US education literature on homework in primary and secondary education and conclude that homework is positively related to academic achievement, with a larger effect at the secondary level than that of primary level. Torberg, (2011) said that homework is a valuable educational tool being a widespread belief among school leaders, teachers and parents and that assigning homework can be seen as an instrument to raise students' effort. Assigning homework is a student policy. The effect of assigning homework is largest in the US, Austria and Australia. For most countries, they find an effect of homework to be about the same magnitude as the average effect. It also depends on the educational institutions.

With survey data, it is not possible to distinguish between the importance of homework and class work. They cannot rule out that teachers who assign relatively much homework in Mathematics also are able to pursue efficient in-class learning, although it seems most likely that the correlation between homework and class work is negative. In that case, he underestimates the pure effect of homework. Dettmers et al., (2009) uses another international comparable achievement test and find in most countries a positive association between achievement in Mathematics and average homework time at the class level as reported by the students.

The small literature in economics which addresses the causal effect of homework is mainly concentrated to students at the universities level. Grodner and Rupp, (2010) present evidence from a field experiment in which a treatment group of students was required to do homework. They find the treatment group got significantly better learning outcomes. The novelty of Grodner and Rupp's paper is that they are able to separate between the effect of being assigned homework and the effect of completing homework. By exploiting natural experiments which randomly divided students into different study groups, both Grove and Wasserman, (2006) and Emerson and Mencken, (2010) find that the students in groups with graded homework increased their achievement.

There are some attempts to estimate heterogeneous effects of homework in the literature. Both (Ronning, (2011); Eren and Henderson, (2011)), find that only students from higher educated parents benefit from homework. Ronning, (2011) also shows that higher educated parents help more with homework than lower educated parents and suggests that assigning homework can amplify existing inequalities through complementary with home inputs.

Adebule, (2014) concluded that those students who were exposed to homework assignment in Mathematics had better academic achievement than those that were not exposed to homework assignment. "Homework assignment is a veritable tool that can reduce the gap between no achieving and high achieving students in Mathematics if well handled". He recommended that Mathematics teachers and instructors should be encouraged to give homework to their students and it should be thoroughly marked, scored and graded. Corrections should be given when necessary.

Gertrude, (2010) stated in his work that homework is one aspect of a traditional Mathematical education and that it tasks are meant to extend and supplement in-class activities and also that an effective homework assignment links to classroom content and leads students to a deeper understanding of the concepts. Homework assignment should be assigned with a reasonable length and specific goal in order to keep students focused and encourage parental support. Even though there is disagreement about the value of homework, majority of parents, educators and policymaker still support the practice of assigning homework to all grade level.

Benefits of homework

The following are some benefits of homework

Home assignment builds up an initiative in students. They initiate study. Teachers get the school work done from students whereas students initiate doing home assignment (Ganiyu, 2012).

To give students a chance to review and practice what they are being taught (Gertrude, 2010).

There is a sense of responsibilities associated with completing home assignment.

Students feel responsible for finishing home assignment and accomplished when they do it.

To prepare students for the next lesson

To extend what students have learned to new contexts.

Home assignment develops time management in student. They start allotting their time to study and play thus learning to complete their schedule task in the time they have (Gertrude, 2010).

Homework can also teach students to concentrate, write reports, spend time alone and develop a curiosity to be a continuous learner (Bishop, 2008).

Home assignment encourages self-discipline in students.

It helps the students to learn with interest.

It builds confidence in their minds.

To encourage and allow students the opportunity to explore and use outside resources (Gertrude, 2010)

It thus improves the academic results.

It enables the teacher to give comments on the work they do. Teacher's positive remark encourages students to learn.

It gives the student practice of whatever they learn in school and practice makes them perfect.

Home assignments give students a chance to amend mistakes and improve on their weakness.

Reading, communicating ideas, taking notes, listening skills, problem solving, planning and prioritizing are life skills that are often reinforced through homework assignments (Gertrude, 2010).

It assists students to score better on class tests, develop attitude to explore and learn.

Actively engaging in homework is to encourage students to be advocates of their own learning.

Self-directed learning can be enhanced with homework by requiring students to use outside resources like libraries, the internet and various reference materials.

With reference to above mentioned advantages of class work and homework, the amount of class work given to student should have a limit due to the limit of time given for each period and the amount of homework given governs its benefits. However, studies have brought out certain rules regarding the amount of home assignment to be given to student at particular age. Homework manifests its benefits only if it is given in right amounts and taken in the right spirit. It is not good to burden children with home assignments and expect them to do well in studies. Homework should be proportionate to their age and mental ability.

Another in-instructional purpose of assigning homework is to encourage students to work with their peer (Gertrude, 2010). The planning of cooperative groups or suggesting and encouraging study groups is beneficial. The benefits of study groups are likewise evident. The material is better understood and retained through multiple learning modalities. Students discuss, explain, and re-examine concepts and/or processes with their peers, thereby reinforcing their own learning (Gertrude, 2010).

The objectives of assigning homework to students are the same as schooling in general to increase the knowledge and improve the abilities and skills of the students, reinforce what students have already learnt, prepare them for incoming lessons and extend what they know by having them apply it to new situation. It gives opportunity to parents to participate in the children's education. Oluwayemi, (2010) reported that students' achievement positively correlates with the socio-psychological environment and the intellectual situation of the home. Chen, (2009) believes that actively engaging in homework assignment encourages students to be advocates of their own learning.

Though a different set of constraints and challenges in education has been faced worldwide, educational development has been actively promoted by means of adapting to rapid global changes (Idiong, 2016). Ensuring quality of education is one of the six educations for all (EFA) goals agreed by over 160 governments during the world Education forum in Dakar Senegal in 2000. The above stated point can be seen in (www.ukessay.com, 2014). The achievement of high school students has been a great concern to educators, teachers, parents and government. Even though measures have been taken to improve the quality of education, a large proportion of students still perform poorly in the classroom and externally organized examinations. Thus class work and homework might be invaluable tools to develop the skills of the learners and help them to perform better in examinations. Therefore the study investigates the extent to which class work and homework improved the achievement of senior secondary school students in Mathematics here in Nigeria.

Ruben et al., (2015), states in his work that the results of the multilevel models have important practical implications. Firstly, model 1 confirms that the relationship between homework and academics result is not linear, something already raised before. The

data suggest that spending 60 minutes per day doing homework is a reasonable and effective time. Furthermore the results indicate that both the quantity of homework and frequency of assignment are related to academic results. In any case, the predominance of frequency over quantity of homework shows that the effect of homework quantity is small (Ruben et al., 2015). The word 'effect' must be understood as "predictive effect". In other words, it is possible to say that effort doing homework is connected to performance; however, it is not possible to say in which direction the association runs (Ruben et al., 2015), discovered in their findings that students have a wide variety of motivating and demotivating factors. Students in this class were motivated to do home assignments due to credit value offered for the assignment, the utility of assignments in studying for exams and a need to learn the material. Students who viewed themselves to be intelligent, conscientious, and have a positive attitude toward school were more likely to complete assignments regardless of credit. Students were less likely to complete homework if they were busy or if the assignments were perceived to be too complicated. Overall, he found a positive relationship between homework completion and academic achievement within this college genetics course.

Antonio et al., (2016) concluded that the amount of homework done and its positive relationship with academic achievement should be considered as a final outcome of a process rooted on a comprehensive and meaningful learning. Some students who are motivated to learn are likely to approach homework deeply and manage homework time efficaciously. As a result, they tend to do more homework and outperform. He summarized with this. Is doing homework a good way to acquire competence, improve skills, and outperform? Our data suggest a positive answer.

Joshua, (2016) in his manuscript talked about "Learn by helping". He said that aside from being able to ask questions freely amongst peers without judgment, theories state that peer help is not only for the less knowledgeable students but also benefits the higher knowledge level student. Joshua reiterated that throughout the use of peer tutoring, it was assumed that the effectiveness came from knowledge trickling down from a teaching professional, to higher knowledge students and lastly to the lower knowledge leveled students. His study explored deeper into the peer educating phenomenon. In addition, the author would like to combine peer education and add in an element to guide and drive motivation further. Goal setting is hypothesized to add an edge to further motivate the students to complete and learn materials (Joshua, 2016).

Academic performance

Refer to the totality of the outcome of education, the extent to which a student, teacher or institution has achieved their educational goals. Ganiyu, (2012) in his work stated several factors that could be responsible for poor performance of students in Mathematics which include the following; the interest of students in Mathematics in relation to the volume of work completed, students' personality and self-concept and that other factors that affect students' interest negatively are feeling of inadequacy, motivation and self-confidence, shortage of quantified Mathematics teachers, poor facilities, equipment and instructional materials for effective teaching, use of traditional chalk and talk methods, large pupils to teacher ratio and Mathematics fright/phobia.

Ganiyu, (2012) stated that take home assignment could be one of the factors that would be responsible for students to arouse interest in the study of Mathematics in secondary school and discovered that most of the students who engaged in take home assignment after the classroom work performed and acquired better retentive ability than their counterparts who were not being exposed to take home assignment and concluded that it is advisable to give students take home assignments.

Statement of the problem

Mathematics is poorly taught and learnt at primary and secondary school levels with the result that achievement is low or outright colossal failure in primary, secondary school and certificate examination. In some schools unqualified teachers and students on teaching practice are normally assigned to teach Mathematics. Some teachers will teach all through without instructional materials and make everything abstract. Some teachers teach at a very high level without considering the level of the students. Some school administrators such as the principals and head of departments display the attitude that the secondary school students can wait till they are about to take their certificate examinations before closed attention and priority are given to them.

Unfortunately by this time, most of the students must have lost hope, having been scaring failing grades over the years and bearing old dogs that learn no new tricks. Class work and homework assignments will be of advantage to improve the performance of students. Thus, this research examined the performances of students' who were constantly exposed to class work and homework assignment in Mathematics and those who were exposed to either class work or homework. It is also aimed at finding out which of these groups of students would retain the concept better.

Objectives of the study

The following are the objectives of this study

To identify some factors that affects students' academic performance in the senior secondary schools.

To find out the effects of classroom exercise and home assignment on the academic performance of students in Mathematics

To give suggestions on what could be done to improve on the resources in our schools system with a view to achieving higher quality products from the system despite the so called students' population explosion and financial crisis in the country.

2. RESEARCH HYPOTHESIS

The following hypotheses guided the study.

Hypothesis I

H₀₁: There is no significant relationship between home assignment and class work on academic performance of students in Mathematics.

H₁: There is significant relationship between homework assignment and class work on academic performance of students in Mathematics.

Hypothesis II

H₀₂: There is no significant difference in the students exposed to home assignment only, class work only and both class work and home assignment before performing the experiment.

H₂: There is significant difference in the students exposed to home assignment only, class work only and both class work and home assignment before performing the experiment.

Hypothesis III

H₀₃: There is no significant difference in the students exposed to home assignment only, class work only and both homework and class work after performing the experiment.

H₃: There is significant difference in the students exposed to home assignment only, class work only and both homework and class work after performing the experiment.

Hypothesis IV

H₀₄: There is no significant difference between the students that were exposed to both class work and home assignment and the students that were exposed to either homework or class work.

H₄: There is significant difference between the students that were exposed to both class work and home assignment and the students that were exposed to either homework or class work.

Population

The population of this study comprises of senior secondary school Mathematics students in Ondo West Local Government. Three of these schools were selected at random from the schools in Ondo West Local Government of Ondo State.

Research instrument

The following research instruments were designed to address the major aim of the research. A questionnaire was designed to elicit information from the students. There were twenty one (21) items in all. The questionnaire was divided into two sections i.e. Section A, which contains personal information like age, sex, class etc and Section B contains series of questions aimed at investigating the effect of class work and home assignments on the academic performance of students in mathematics in Nigerian secondary schools. The researchers gave out the questions to experts in mathematics for validation and reliability.

Twenty five tests Mathematics question items were set based on the topic the students have been taught. The questions were given out to the experts in the field of Mathematics for validation and reliability. A pre-test is administered on the students for the purpose of homogeneity. Simple random sampling techniques were carefully adopted to select and reflect equal representation from each of the three schools. The pre-test is assigned to ascertain the entry behaviour of the students and to give the basis for finding out whether there is a significant difference in the groups' abilities before the treatment was given. That is before the experiment was carried out.

Post-test items are also constructed by the researchers which cover all the topics taught during the instructions. The purpose was to give the basis for the finding out whether there would be significant difference between any of the two groups and to evaluate the students' achievements.

Administration of instrument

Before anything is done at all the researchers took time to analyse the SSS1 syllabus for effective teaching and for the selection of the best topic to be taught during the period of this experiment.

A pre-test Mathematics questions consisting of 25 items which comprises of objectives and theories were also set based on the taught concept. The researchers gave out the questions to experts in mathematics for validation and reliability. The researchers administered the questionnaire to the students of the selected school. Then they collated the questionnaire. The researchers conducted the pre-test to all the three groups to see if there are significant difference in the groups' abilities before the treatment was given.

The researchers taught the first group and gave homework only after each class, collected and marked the scripts of the lesson he had with group 1. The researchers taught the second group and gave class work after each class, collected and marked the script before the next class. The researchers taught the third group and gave both class work and homework; he marked and did correction as expected. A post-test was conducted to all the three groups and the scores of the test was collected and analyzed. The same process was repeated for all the three schools.

The following statistical methods were used as analytical tools.

Pearson product moment correlation,

Analysis of variance (F-TEST or ANOVA) and t-test

3. METHODS /PROCEDURE

The study population was based on survey design. The schools involved were visited personally by the researchers and information about the research work was disseminated to the administrators, teachers and students of the classes involved. The target population of the study constituted the senior classes of secondary schools in Ondo West Local Government Area of Ondo State. Since the total population of students in all secondary schools in Ondo West local Government cannot be sampled, three schools were randomly selected. 120 students were selected from each of these three schools making it a total sample of 360 students. The 120 students will be divided into 3 groups, 40 in group X, 40 in group Y and 40 in group Z.

Hypotheses

The following hypothesis will be tested for:

Hypothesis I

H_{01} : There is no significant relationship between home assignment and class work on academic performance of students in Mathematics.

H_{11} : There is significant relationship between home assignment and class work on academic performance of students in Mathematics.

Table 1 Pearson Product Moment Correlation Test result for hypothesis 1

Test for hypothesis	r-cal	r-critical	Decision	
			H_{01}	H_{11}
Hypothesis 1	1.044	0.378	Rejected	Accepted

From table 1, the results from students responses shows that the value of the Pearson Product Moment Correlation calculated $r_c = 1.044$ from the sample size of 120 while the table value of the correlation $r_t = 0.378$. Since $r_c > r_t$ i.e. $1.044 > 0.378$, the first null hypothesis H_{01} is rejected. Hence, the first alternative hypothesis H_{11} is accepted. It can therefore be concluded that there is significant relationship between the homework and class work on academic performance of students in Mathematics.

Hypothesis II

H₀₂: There is no significant difference in the students exposed to home assignment only, class work only and both class work and home assignment before performing the experiment.

H₂: There is significant difference in the students exposed to home assignment only, class work only and both class work and home assignment before performing the experiment.

Table 2 Shows the F-test result for hypothesis II

Sources of variation	Degree of freedom	Sum of square	Mean square	F-calculated	F-critical	Decision
Between Group	2	732.200	366.100	1.070	3.170	H ₀₂ Accepted
Within Group	117	40036.125	342.189	-	-	H ₂ Rejected

Table 2 shows the result of the score of pre-test given to the 120 students before performing the experiment. Analysis of variance (ANOVA) was used for the analysis. From Table 2, the value of F-cal is 1.070 and F-crit is 3.170 at 0.05 alpha levels. Since the value of F-cal. < F-crit, then the second null hypothesis H₀₂ is accepted while the second alternative hypothesis H₂ is rejected. It can therefore be concluded that “there is no significant difference in the students exposed to home assignment and those without home assignment before performing the experiment”.

Hypothesis III

H₀₃: There is no significant difference between the students exposed to home assignment only, class work only and both home assignment and class work after performing the experiment.

H₃: There is significant difference between the students exposed to home assignment only, class work only and both home assignment and class work after performing the experiment.

Table 3 shows the F-test result for hypothesis III

Sources of Variation	Degree of freedom	Sum of square	Mean square	f-calculated	F-critical	Decision
Between Group	2	32264.250	2630.859	9.539	3.170	H ₀₃ Rejected
Within Group	117	5261.717	275.763	-	-	H ₃ Accepted

Table 3 shows the result of the scores of post-test conducted to the 120 students after performing the experiment. ANOVA was used for the analysis. From Table 3, the value of F-cal is 9.539 and F-crit is 3.170 at alpha level of 0.05. Since the value of F-cal > F-crit, the third null hypothesis H₀₃ is rejected. Hence, the third alternative hypothesis H₃ is accepted. It can therefore be concluded that there is significant difference between the students exposed to home assignment only, class work only and both home assignment and class work.

Hypothesis IV

H₀₄: There is no significant difference between the students exposed to both home assignment and class work and the students that were exposed to either homework or class work.

H₄: There is significant difference between the students exposed to both home assignment and class work and the students that were exposed to either homework or class work.

Table 4 shows the t-test result for hypothesis IV

	Group	N	X	S.D	t _c	t _t	df	R
A	Group1	40	63.625	18.101	3.275	1.671	78	H ₄ accepted
	Group2	40	50.550	17.605	-	-	-	
B	Group2	40	50.550	17.605	0.513	1.671	78	H ₀₄ accepted
	Group3	40	48.775	13.001	-	-	-	

C	Group1	40	63.625	18.101	4.214	1.671	78	H ₄ accepted
	Group3	40	48.775	13.001	-	-	-	-

Group 1 was taught and they were given home assignment only after each class.

Group 2 was taught and they were given class work only after each class

Group 3 was taught and they were given both homework and class work after each class

Table 4 shows the result of the scores of post-test conducted after performing experiment in the different groups. t-test was used for the analysis. The value of t-calculated is 3.275 and t-critical is 1.671. Since t-cal is greater than t-crit i.e. $3.275 > 1.671$. The fourth null hypothesis H_{04} is rejected while the fourth alternative hypothesis H_4 is accepted. It shows that “there is significant difference in the students that were taught with home assignment only and class work only”

Comparing group 2 and group 3, The value of t-calculated is 0.513 and t-critical is 1.671 It was discovered that $t\text{-cal} < t\text{-crit}$ i.e. $0.513 < 1.671$ which implies that “there is no significance difference in the student that were exposed to class work only and both home work and class work”.

Lastly comparing group1 and group3 to see if there is differences between the two groups, the value of t-calculated is 4.214 and t-critical is 1.671 $t\text{-cal} > t\text{-crit}$ i.e. $4.214 > 1.671$, H_4 is accepted, which implies that “there is a significant difference between the student that were exposed to homework only and both class work and homework.

The result of table 4 (a) shows that the results obtained conformed to Ganiyu, (2012) who concluded that students who engaged in take home assignment have a better retentive ability than their counterparts. And also with Adebulu, (2014) who concluded that those students who were exposed to homework assignment had better academic achievement than those that were not exposed to homework. The result obtained from table 4(b) does not concur with the research of Patrick, (2012) who stated that there is no significant difference between students’ performance who were exposed to class work only and homework only. But this research work is in line with the works of McMullen, (2010), Henderson (2011), Busscher (2009), Wasserman (2006), Emerson (2010) and Mencken (2010).

4. DISCUSSIONS AND FINDINGS

The study examined the effect of classroom exercise and home assignment on academic performance of students in Mathematics. The purpose of the research work was to find out if there would be significant difference in the performance of students that are exposed to both classroom exercise and home assignment and those that were exposed to either class work only or homework assignment only.

The first hypothesis required to show if there were significant relationship between home assignment and class work on the academic performance of students in Mathematics. The result obtained from questionnaires administered show that there is positive relationship between class work and homework on academic performance of students. The percentage of those who agreed is 78% and 22% disagreed. Pearson’s Product Moment Correlation was used to analyse the data collected from students responses in the questionnaire and it was seen that there is positive relationship between class work and homework on academic performance of students. This implies that effective class work and homework given to students will lead to a better performance in Mathematics.

The second hypothesis required a comparison between the performances of students that were given class work only, homework only and both class work and homework before the experiment was performed. The result from the analysis made in table 2 shows that there was no significant difference between the three groups. This implies that the students in one group did not perform better than the other groups before the experiment was performed. F-test was used to analyse the performance of students in the three groups and there was no significant difference between the groups.

The third hypothesis required a comparison between the performances of students in the three groups after performing the experiment. F-test was used to analyse data collected from post-test. The result obtained from table 3 shows that there is significant difference between the students performance in the three groups. This implies that one group performed better than the other groups.

The fourth hypothesis required a comparison between the performance of students that were given only home assignment after each lesson and those that were given only class exercise during each lesson. There was significant difference between these two groups. On giving class exercise to students, the teacher determine on the spot whether the students understood what they were taught or not and as well ascertaining to what extent the objectives of the lesson have been achieved. These measures are also

achievable when the teacher gave home assignment to students instead of class exercise. However, the students had more time to think deeply on the given homework, revisit their notes and textbooks as well as liaise with their mates in order to gain mastery of the concept Table 4 (a) shows that the students that were given only homework performed better than the students that were given only class work.

The fourth hypothesis attempted to ascertain the influence of combined class work and home assignment on students' performance in Mathematics. Table 4 (b) shows that there was no significant difference between the mean of scores of those that were exposed to both class work and home assignment on students' academic performance in Mathematics. Some factors are responsible for this; one of the reasons is that each lesson had a maximum of 5 exercises to be given after some examples. All the 5 questions were given at a time to the first group while the 5 questions were divided into 3 class works and 2 home assignments or 2 class work and 3 home assignments according to the available time remaining for the period to over after explanation and example for the second group.

The fourth hypothesis also attempted to ascertain the influence of home assignment on the students' performance in Mathematics. There was significant difference between the mean scores of those that were exposed to only home assignment and those with combined home assignment and class work. The result shown in table 4 (c) was a surprise to researchers and other that heard about it. From table 4 (c) students that were given only home assignment performed better than those with combined home assignment and class work. The reason for this is due to the fact that I had enough time to teach them to my satisfaction and also they had enough time to think on how to do their home work. They revise their note on daily basis. They read and solved more problems on the treated topic from textbooks. Their responses in class the next day do show that they do not forget what they were taught in previous lesson.

Giving of both class-room exercise and home assignment is efficient and this will promote students learning if and only if the teacher gives students enough questions for both class work and homework and should not allow the time used for marking the home work to affect the class work. They forget less when they try to lay hands on specific Mathematical drills given as homework. The students tend to consult one another on a more frequent basis. The group cooperation among student facilitates learning of various Mathematical skills better than when students work singly or in isolation. The above finding is consistent with Adebule, (2014) who concluded that those students who were exposed to homework assignment had better academic achievement than those that were not exposed to homework.

5. CONCLUSION

The following conclusions were deduced from the study. The study has considered how classroom exercise and home assignment can influence student's performance in Mathematics. It should be appreciated that student's ability to gain mastery of the subject lies largely on the attitude of teachers and manner in which they present the subject. Teachers and parents are therefore urged to keep on doing their best in playing their roles in motivating students to love the subjects and gain mastery of it so as to attain greater heights to which Mathematics is a stepping stone. Having subjected the data collected to analysis using Pearson product-moment correlation analysis of variances and t-tests, it was discovered that most of the students who engaged in home assignments performed and acquired better retentive ability than their counter parts in other groups. It can therefore be concluded that it is advisable to always give students home assignments.

Recommendation

The recommendation of this study are directed at what could be done to improve on the resources in our schools system with a view to achieving higher quality products from the system despite the so called students' population explosion and financial crisis in the country.

It is hereby recommended that:

Teachers should endeavour to give home assignments to their students after classroom work daily. They must ensure that such assignments are marked promptly and the results given to their students. Parents and wards should recon with take home assignments by monitoring their children at home in ensuring that they do the assignment given to them by their teachers on daily basis. Parents and wards should be made to realize that their children or need assistance in doing the assignments given to them by their teachers from the school. They should also take the responsibility of reminding them to do their assignments when they are back from the school. If the Parents however do not have time in assisting, the elder children at home could be involved in assisting the junior ones.

Ethical approval

Not applicable.

Informed consent

Not applicable.

Conflicts of interests

The authors declare that there are no conflicts of interests.

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Data and materials availability

All data associated with this study are present in the paper.

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